

**Amendments to the Specification:**

Kindly insert after the title, the following paragraph:

**CROSS-REFERENCE TO RELATED APPLICATION(S)**

This application is a continuation of copending application U.S. Serial No. 09/812,115, filed on March 24, 2001.

Kindly delete seven contiguous paragraphs starting at page 4, line 1 and ending on page 7, line 14.

Please insert seven contiguous paragraphs excised from the Summary of the Invention before the paragraph starting at page 8, line 14, as follows:

In specific embodiments, a folded solar telescope of the invention is housed in a frame whose shape is described by a regular  $n$ -sided polygon, where  $n$  is an integer greater than 2, such as an equilateral triangle, a square, and the like. The telescope comprises an objective lens, two or more mirrors or prisms to fold the path of the light, an "eyepiece" lens and a viewing screen. The telescope components are suitably mounted on the telescope frame or on braces or other support objects that are mounted to the telescope frame.

The regular polygonal telescope frame rests on a curved telescope support device where preferably the curvature of the support device's curved surface is defined by an arc of the circle that inscribes the regular polygon of the telescope frame. Preferably, the center of mass of the telescope is substantially coincident with the geometric center of the  $n$ -sided regular polygonal telescope frame. Further the center of mass of the telescope is substantially coincident with the

origin of the circle that describes the curvature of the curved telescope support device because the origin of this circle is coincident to the center of the regular polygon of the telescope frame. The telescope's center of mass is substantially located at an energy minimum for any elevation of the telescope from 0° to 90°, thereby minimizing or eliminating rotational strain or torque on the telescope at virtually any telescope elevation. Consequently, a small amount of friction inherent to the contact between two or more apexes of the polygonal telescope frame with the curved surface of the telescope support device is sufficient to stabilize the telescope at a specified elevation. Additional stabilization aids such as clamps, spring rollers or other mechanical fasteners or tensioners are not required. Adjustment of the telescope elevation is simple to effect by overcoming the small amount of inherent static friction without the need for releasing or manipulating one or more stabilizing fasteners or tensioners.

The angular size of the sun is approximately  $\frac{1}{2}^\circ$  and pointing an instrument with a field of view of this size can be difficult. The present invention further includes a targeting system with one or more pointing aids to assist in adjusting the alignment of the telescope such that an object (e.g. the sun) is projected onto a viewing surface. The aiming process includes first pointing the telescope aperture and objective lens in the general direction of the sun. Additional telescope adjustment can include refining the alignment using a gnomon that is parallel to the axis defined by the center of the objective lens and the center of the first mirror or prism used for folding the path of the sun's rays. Minimizing or eliminating the shadow cast by the gnomon brings the telescope into closer alignment with the target e.g. the sun. More sensitive telescope orientation refinement can further include using a pointing target assembly where a secondary aperture and a target define an axis parallel to the axis defined by the center of the objective lens and the center of the first mirror or prism for folding the path of the sun's rays. Localizing the light rays from the secondary aperture onto the target brings the telescope further into alignment with the target

e.g. the sun. The pointing target assembly is generally a more accurate targeting device than a gnomon. Preferred telescope alignment involves sequential orientation refinement steps with both a gnomon and a pointing target assembly to align the telescope with the sun to facilitate the projection of a solar image onto a viewing screen or surface.

In preferred embodiments, a gnomon or other geometrically regular object with one long dimension can be attached to the exterior of the telescope frame such that the gnomon is parallel to the axis defined by the center of the objective lens and the first mirror or prism. Preferably the long dimension of the gnomon or other regular object is parallel to the axis defined by the objective lens and the first mirror or prism. Adjusting the telescope orientation to eliminate the shadow cast by the gnomon brings the telescope into better alignment with the sun.

Preferred telescopes further comprise a second, more sensitive targeting assembly. A second aperture with a relatively small diameter is located in close proximity to the primary telescope aperture on the telescope frame. Additionally, the telescope has a pointing target mounted within the interior of the telescope frame. The pointing target is located so the line between the center of the target and the center of the second aperture is substantially parallel to the axis defined by the primary aperture and the first light-folding component e.g. mirror or prism. Localizing the light beam from the second aperture on the pointing target causes the light passing through the objective lens to contact the first light-folding mirror bringing the telescope into closer alignment with the target e.g. the sun.

For telescopes that include both a gnomon and a pointing target orienting apparatus, the distance between the second small aperture and the pointing target is preferably between 2 and 20 times the length of the gnomon. More preferably the distance is between about 4 and 12

times the length of the gnomon. Consequently the sensitivity of the pointing target pointing aid is more sensitive than the gnomon pointing aid by a factor of about 2 to about 8.

In additional embodiments, targeting methods are included whereby the elevation and azimuth of the telescope are adjusted according to one or more targeting steps to facilitate image acquisition of a specified target, e.g. the sun. The first rough telescope orientation is to set the approximate azimuth by orienting the telescope so that the frame is pointing towards the target. The first refinement is accomplished by adjusting the elevation and azimuth of the telescope so that the shadow cast by a gnomon is minimized or preferably eliminated. Additional, more sensitive refinement of the telescope orientation is accomplished by adjusting the elevation and azimuth of the telescope so that the beam of light passing through the second small aperture strikes the center of the pointing target. The pointing target based telescope orientation adjustment is about 2 to 8 times more sensitive than the gnomon-based adjustment. Preferably the pointing target refinement is about 3 to 5 times more sensitive than the gnomon-based adjustment. Final telescope orientation is accomplished by centering the target image, e.g. an image of the sun, on the viewing surface.

Kindly amend the paragraph starting at page 8, line 14 as follows:

Referring now to the various figures of the drawing wherein like reference characters refer to like parts, there is shown in FIG. 1, a folded solar telescope, 10, wherein the equilateral triangular telescope frame ~~57-60~~ has an aperture 20 to admit the sun's light 2. In line with the aperture is the telescope's objective lens 22 mounted in a tube 24. The sun's rays 2 pass through the objective lens 22 into the enclosure (not labeled). The larger the diameter of the lens 22, the brighter the image projected onto the viewing surface 36. The lens can be an achromat, corrected for chromatic aberration and/or other optical defects. The path of the sun's rays 2 are then folded by at least two or preferably three mirrors or prisms 26, 28, and 30 within the telescope frame enclosure to bring them to a focus 32. A curved mirror 30 can be used to act as a focusing and reflecting element together as in a Newtonian telescope. After the primary focus, the rays pass through an "eyepiece" lens 34 that magnifies the image. Alternatively, in a Galileian telescope design, the eyepiece 34 is located before the focal point 32.

Kindly amend the paragraph starting at page 14, line 8, as follows:

In other preferred embodiments of the present invention, the solar telescope 10 is aligned with the sun by using a pointing target to properly orient the telescope so an image of the sun is projected onto a viewing surface. A telescope is initially placed on a surface so the objective lens 22 and gnomon 50 are facing in the general direction of the sun. Light rays 2 are admitted through a secondary aperture 52 located in close proximity to the primary aperture 20 and objective lens 22 assembly. The admitted light strikes the interior surface of the telescope frame 60 opposite from the secondary aperture. By observing the location where the admitted light strikes the interior of the frame relative to a pointing target, the direction and magnitude of azimuth and elevation corrections can be determined. The azimuth and the elevation of the

telescope are adjusted sequentially or concomitantly based on the relative location of the light contacting the telescope frame until the admitted light strikes the pointing target thereby bringing the telescope into alignment with the sun<sup>36</sup>.

Kindly amend the paragraph starting at page 17, line 9, as follows:

In specific embodiments of the invention, the folded solar telescope 10 is housed in a cylindrical frame 62 and the base telescope support device 72 is a horizontal cylinder, as shown in FIG 2, FIG 4, and FIG 5.— Thus, in FIG 2, FIG 4, and FIG 5, the telescope support device is a cylinder with a smaller diameter than the diameter of the cylindrical telescope frame and the axis of the cylindrical telescope support device is perpendicular to the axis of the cylindrical telescope frame. ~~changing~~ Changing the unit's azimuth can be achieved by shifting the orientation of the cylindrical telescope frame 62 in the base telescope support device 72. Edges of both cylinders are chamfered 64 to a complementary angle or otherwise shaped to approximate the tangent of the enclosed sphere. The chamfered cylinder edges enlarge the contact area between the telescope frame and the telescope support device thereby stabilizing the telescope and simplifying the process of aligning the telescope with the sun.